

Wa 6906
76.6.87
4a

Memo



To: Bob Farrell
From: Florence Hoar *AH*
Re: Pacific Wood Treaters. Ridgefield Brick and Tile site
Ridgefield, Washington
Date: June 6, 1987

Summary

The RBT site is located on alluvial deposits described as primarily silts and silty clays, overlying a "mica sand" at depths of 12 to 53 feet.. The thickness of this mica sand ranges, based on available on-site information, between 2 and 11 feet, where present. This sand layer is saturated at least part of the year. Water samples were able to be obtained from 2 of the lysimeters installed in it, and there is a dug well on the site.

The surficial materials overlie the Troutdale Formation, a Tertiary deposit consisting of a cemented sand and gravel upper member, and a lower member of silts and clays. The surface of the Troutdale is described as being very irregular. There is some evidence that it is deeper uphill of the site than downhill. Since many of the subsurface explorations on the site were not leveled-in, but were based on USGS topographic maps, this is somewhat speculative.

Waste at the RBT site was disposed of in a pit excavated through the clay into the "mica sand". No grain size distribution of this mica sand, nor any of the other surficial materials on-site, have been provided.

A closing plan was submitted in July, 1983, and final closure was completed in November of the same year. Closure consisted of installing an underdrain system in the mica sand, a bentonite amended liner, a leachate collection system called a toe-drain, and then moving the waste to the lined area. The waste was graded, compacted, and covered with a cap of 1.5 feet of silty soil compacted to a permeability of $10E-6$ cm/sec, and 1.5 feet of additional soil suitable to promote runoff and to support grass. An inspection report (R. Stamnes, 5/14/85) notes animal damage to the final cover. Drainage from the underdrain and toe drain are said to have occurred after closure.

Suction lysimeters were installed to sample water in the "mica sand." Locations of these lysimeters were not apparently based on an on-site hydrogeological investigation, but rather, likely routes of migration of contamination from the site. Locations are not shown on any plan. The main objective was to intercept the intermittantly saturated zone of sand. It is not obvious from the boring logs done during

sand. Additionally, 4 private wells near the site are being monitored. The private wells are installed in the deep (Troutdale Formation) aquifer, at depths of over 200 feet.

A water balance, done in conjunction with the closure plan, estimated leachate generation at 408,000 cubic feet per year before closure, and 22,700 cubic feet per year after closure. Leachate is not collected and treated. The collection system consists of a 55 gallon drum, which is periodically bailed out onto the ground. No documentation of volumes generated are therefore available.

Water in the private wells, lysimeters, toe drain distribution box and toe drain sump was monitored for 4 quarters after closure for the primary drinking water standards metals listed in Appendix III; pH, conductivity, PCP, napthalene, and total phenol. The rest of the Appendix III parameters were not done. Of the parameters establishing ground water quality, only total phenol was done. TOC and TOX were not done.

The closure plan dated 2/17/87 proposes only to install 4 deep monitoring wells around the site to monitor the deep Troutdale Formation. The parameters proposed to be monitored for the first year are)1 the Appendix III parameters, exclusive of radioactivity, coliform, and pesticides, once;)2 ground water quality, 5 quarters;)3 ground water contamination, 5 quarters;)4 RBT site specific compounds (PCP, napthalene, arsenic), 5 quarters. Ground water level measurements are proposed to be made at each sampling. No hydrogeologic investigation is proposed to assess hydrogeologic conditions at the site, including horizontal and vertical gradients. The upper, seasonal water table aquifer is completely ignored.

Conclusions

The PWT/RBT ground water monitoring program proposed in the Closure Plan, dated 2/19/87, does not meet the requirements of ground and surface water monitoring under 40 CFR Part 265, subpart F in several respects:

1. Monitoring well are proposed to be located only in the lower aquifer, in the Troutdale Formation. The upper, at least intermittantly saturated zone above the Troutdale, is not proposed to be investigated and monitored.
2. The current submission proposes to install the monitoring wells using "assumed" upgradient and downgradient well locations.
3. No onsite hydrogeologic investigation is proposed, nor has ever been conducted, in order to determine site specific ground water flow conditions and directions.
4. Table 2, the proposed program, does not meet the requirements

quarterly characterization program, establishing background concentrations for 1 Appendix III parameters; 2 parameters establishing ground water quality; 3 indicator parameters. Appendix III parameters are proposed for only one quarter. Applicant proposes instead to monitor only those parameters known or suspected to be a potential problem, based on the waste disposed of at the site. Since the waste itself was never properly characterized, this proposal is inappropriate.

Recommendations

A detailed subsurface/hydrogeological investigation must be conducted at the site, to determine both horizontal and vertical groundwater flow conditions. The surface of the Troutdale Formation is reportedly very irregular, and "ponding" of contaminated water in the shallow zone may contribute to local recharge of the deep aquifer. It is likely that all the private wells around the site are hydraulically downgradient of the facility, even the Falls well (well 1), which is uphill. The Ryf well, said to be some distance from the facility, is not located on any plan. Early testing results of this well showed concentrations of arsenic and chromium to be close to, or in excess of the primary drinking water standards. The Cemented gravels noted below the alluvial deposits on site should also be investigated. Most of the reports assume this to be the Troutdale Formation. However, no cores have been taken and described from this deposit. Since the alluvial deposits in the region are described as consisting of sand, gravel, and silt, it is possible that the gravels noted in the investigations are not the Troutdale at all.

A qualified geologist/hydrogeologist should undertake this investigation. The existing subsurface investigations should be re-evaluated, surveyed and leveled-in where possible. An elevation survey of the site should be conducted. The subsurface investigations should be accurately located on a plan. A test boring program should be carried out. Continuous split spoon sampling should be done in the surficial materials. In situ hydraulic conductivity tests should be run at varying depths. Jar samples should be analyzed for grain size distribution. Piezometers should be installed at appropriate levels. Ground water elevations should be read periodically, and used to construct horizontal and vertical flow nets.

As the presence of ground water is described as being seasonal in the mica sand unit, an onsite investigation of the lower aquifer should be done as well. Hydraulic conductivity tests should be conducted. All new investigations should be surveyed and leveled-in.

Subsurface geophysical methods might be useful in determining boring locations.

determine the locations of the monitoring wells.

PWT/RBT's consultant is proposing to conduct a boring and sampling program of the landfill itself. Although that program is not the subject of this review, the proposal to resurvey the site, and provide an up-to-date plan of the landfill area topography, should be done. Since drilling is proposed to be conducted in the landfill, it would be extremely useful to obtain information on the water content and distribution in the landfill, to evaluate the performance of the cap. Moisture percent should be analyzed, and the elevation of any saturated zone(s) measured.

The closure plan proposes deep well installation in September when the ground has become firm and dry. I recommend that the surficial investigation boring program and shallow well/piezometer installation be conducted well in advance of that time.